

Remarks

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested. Claims 1 – 38 remain in this application.

1. Drawings

The Examiner has objected to the drawings under 37 CFR 1.84(p)(5) because reference numeral 108 is not included in the Drawings. In response, the Applicant has amended Figure 2 to include reference numeral 108. A copy of amended Figure 2 is attached hereto.

The Examiner has objected to the drawings under 37 CFR 1.84(p)(5) because reference numerals 22, 24, 32, 402, 404, and 408 – 426 are not explicitly mentioned in the description. Although the Specification tracks the Figures quite well, and describes each step with clarity, the Applicant has amended the Specification to include an explicit reference numeral for each element and step in the Drawings to respond to the Examiner's Objection.

The Applicant respectfully requests that the Objection to the Drawings be withdrawn in light of the amendments to the Specification and Drawings.

2. Specification

The Examiner has indicated that on page 3, line 6, a period should be replaced by a comma. In response, the Applicant has amended the Specification to thereby correct the typographical error.

The Applicant respectfully requests that the Objection to the Specification be withdrawn in light of the amendment to the Specification.

3. § 103 Rejections

A. The Examiner has rejected claims 1 – 9, 11, 12, 14 – 19, 22 – 28, and 33 – 36 under 35 U.S.C. § 103 as being unpatentable for obviousness over U.S. Patent No. 5,940,472 to Newman et al. (hereinafter Newman) in view of U.S. Patent No. 6,208,618 to Kenney et al. (hereinafter Kenney).

Independent claims 1, 22, 33, 34, and 35 are patentable under 35 U.S.C. § 103 because the Examiner has failed to point out where the cited prior art teaches all of the elements recited in these claims. For example, the Examiner failed to show where the prior

art taught the steps of establishing (claims 1, 34), transmitting (claims 1, 33, 34), receiving (claims 1, 33, 35), processing (claim 1, 33, 35), or comparing (claim 1, 33, 35). The Examiner also failed to show where the prior art taught a system that included the transmission unit and receiving unit recited in claim 22. Furthermore, Independent claims 1, 22, 33, 34, and 35 are patentable under 35 U.S.C. § 103 because Newman and Kinney are not properly combinable.

Newman teaches is directed towards an automated telecommunications test system for testing telecommunication networks that include intelligent network elements such as automated response units, and manual network elements such as manual operator consoles. The system includes a controller 100 and a call generator 103. The controller 100 is coupled to an operator network center (ONC) 104 via a pair of bi-directional communication channels 107 and 105. The controller bi-directionally communicates with ONC operator services such as manual consoles and Audio Response Units (ARUs). The call generator 103 is coupled with a 3/1 digital cross connect (DXC) 124 via a pair of T1 communication lines 122 and 121. The call generator 103 is adapted to respond to Audio Response Units (ARUs) with vocal responses. The DXC 124 is coupled with a switched network 126 via a plurality of T1 transmission lines 123. The switched network 126 is coupled with an signal transfer point (STP) pair 132, an automated call distributor (ACD) 134, a data base 141 and a billing verification system 120. Further, the switched network employs SS7 signaling. Thus, Newman's system is employed to test circuit switched networks.

Referring back to controller 100, controller communications means are used to send input messages to ONC devices and receive status messages from ONC devices. Thus, Newman's system provides a means to control manual operator consoles in response to messages sent by controller 100. Similarly, the system provides a means to monitor the progress of test calls by receiving status messages from ARUs and operator console devices.

Kenney teaches is directed to a method and apparatus using selectable replacement data generators to replace lost PSTN data in a packet network. The apparatus includes a lost packet detection unit 402 that is configured to receive a packet stream Si, (i.e., packet data for connection i), as an input. The lost packet detection unit 402 examines each packet in the stream Si to determine when packets are missing, corrupted, not available when needed, or otherwise require substitution with replacement data. Detection unit 402 detects missing packets by checking the sequence numbers of each packet in Stream Si. It detects packet

corruption by checking error correcting codes. The lost packet unit 402 indicates when replacement data is needed by inserting one or more signals Li in stream Si, as appropriate.

According to the **MPEP 2143**, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

1. The prior art references do not teach or suggest all the claim limitations.

Claims 1, 33, 34, 35:

The Examiner asserts that the Newman teaches a test system and method for detecting dropped packets in a network that includes a packet switched network. The Examiner relies on col. 3, lines 46 – 59 and col. 4, lines 30 – 47 to back this assertion. As noted above, Newman's test system includes a controller 100 and a test call generator 103. However, the cited text states explicitly, that test call generator 103 generates test calls according to commands from controller 100, and also "receives test calls from the switched network 126." Thus, Newman does not teach or suggest a test system, computer readable medium, or method for detecting dropped packets in a network that includes a packet switched network, as recited in claims 1, 33, 34, and 35. Newman is directed to a system for testing network resources disposed in a circuit switched network.

The Examiner asserts that the method of Newman's apparatus includes the step of establishing a telephonic connection between a first network location and a second network location. The Examiner relies on col. 2, lines 64 – 67 for the proposition that Newman teaches this claim element. The cited text states that "a test call generator is used to generate test calls in the communications network." While this seems conclusive, it is not, because the Examiner is failing to consider all of the claim limitations. Applicant notes that when the claim is considered in its totality, the claim step establishes a telephonic connection between two network locations in a network that includes a packet switched network. Newman, on the other hand, teaches a test call generator 103 that sends and receives test calls between

switched network 126 via T-1 lines 123 (see Figure 1 and col. 4, lines 42 – 47). Thus, Newman does not establish a telephonic connection between two network locations in a network that includes a packet switched network. The examiner does not assert that Kenney discloses this step. Thus, the Examiner has failed to show where either Newman or Kenney, whether taken alone or in combination, teach or suggest the step of establishing as recited in claim 1.

The Examiner asserts that the method of Newman's apparatus includes the step of transmitting at least one set of N waveforms from the first network location. To back this assertion, the Examiner relies on col. 8, lines 16 – 57 and col. 16, lines 59 – 63. The text in col. 8 refers to a method for testing a manual operator console (MOC) shown in Figure 2. The first step (201) involves placing the MOC in test mode, such that it is expecting to receive a test message from generator 103. This involves the transmission of a digital control message from controller 100 to the MOC via a separate control line 107. "In step 201, the MOC is placed in test mode. The controller 100 sends a MOC test mode message to the MOC 108 via the communication line 107. This causes the MOC 108 to put itself into testing mode" (see col. 8, lines 21 – 24). The format of the digital control messages is provided in the Appendix starting at the table provided at col. 15. The text in col. 16 is part of an Appendix that details the format of the digital control messages transmitted from controller 100 to the MOC via line 107. This is not the test message itself, it merely places the MOC in testing mode. This is clear from col. 8, lines 41 – 43: "[n]ext, in step 202, the test call is set-up by the call generator 103". Subsequently, the test call set-up is performed by either directly dialing the MOC under test (by SAGE 112) or by out-of-band signaling using SS7 (by MGTS 146). Either way, the test voice message is sent to the manual operator console by way of switched network 126.

In light of the above, the Applicant makes the following points. First, the digital control message is not being transmitted via a telephonic connection from a first network location to a second network location, it is being transmitted directly from controller 100 to the MOC via a separate control line 107 (See col. 8, lines 21 – 24). Second, the digital message does not comprise "at least one set of waveforms" as recited in claim 1 and described in the specification (Page 10, line 18 – page 11, line 25); it merely includes a sequence number in the message. This by the way, violates the step of comparing, since the claimed invention requires that there be no access to control data. Since the sequence numbers are sent via separate control line 107, the sequence numbers cannot possibly be

construed as being a set of waveforms. Third, the sequence number in the digital control message is not “a waveform characteristic operative to assign a predetermined value relative to other waveforms in the at least one set,” for the same reasons. Fourth, the analog test call generated by test call generator 103 does not comprise “at least one set of waveforms” as recited in claim 1. Claims 33 and 34 have similar limitations.

Nowhere in the cited text does Newman describe the transmission of a set of waveforms, wherein each transmitted waveform includes a waveform characteristic operative to assign a predetermined value relative to other waveforms in the at least one set, such that a predetermined sequence of values are assigned to packets carrying the N transmitted waveforms. The Examiner does not assert that Kenney has this feature. Thus, the Examiner has failed to show where either Newman or Kenney, whether taken alone or in combination, teach or suggest the step of transmitting, as recited in claim 1, 33, and 34.

The Examiner also asserts that the method of Newman’s apparatus includes the step of receiving at least one telephonic signal at the second network location via the communications channel. The Examiner relies on col. 8, lines 16 – 57, which was discussed above. Again, Applicant points out that the Examiner is failing to consider all of the claim limitations. In light of the preamble, the claim step is directed to receiving at least one telephonic signal at the second network location. As pointed out above, it is implicit that the second location is in a network that includes a packet switched network. Newman does not disclose this. Test call generator 103 sends and receives test calls between switched network 126 via T-1 lines 123 (see Figure 1 and col. 4, lines 42 – 47). The examiner does not assert that Kenney discloses this step. Thus, the Examiner has failed to show where either Newman or Kenney, whether taken alone or in combination, teach or suggest the step of receiving at least one telephonic signal at the second network location, as recited in claim 1, 33, and 35.

The Examiner asserts that the method of Newman’s apparatus includes the step of processing the at least one telephonic signal to obtain a received sequence of values. The Examiner again relies on col. 16, lines 59 – 63, which discloses the format of the control message transmitted from controller 100 to the MOC via separate control line 107 (See Figure 1 and col. 8, lines 21 – 24). As pointed out above, the analog test message sent by generator 103 via switch network 126 does not include any embedded sequence of values. Thus, the Examiner has failed to show where either Newman or Kenney, whether taken alone or in combination, teach or suggest the step of processing, as recited in claim 1, 33, and 35.

The Examiner asserts that the method of Newman's apparatus includes the step of comparing the received sequence of values to the predetermined sequence of transmitted values to detect dropped packets without having access to packet switched network control data. Once again, the Examiner relies on Col. 16, lines 59 – 63 to support his assertion. However, this assertion is erroneous for the reasons provided above. The digital control message is not being transmitted via a telephonic connection from a first network location to a second network location. It is being transmitted directly from controller 100 to the MOC via a separate control line 107 (See col. 8, lines 21 – 24). The digital message does not comprise "at least one set of waveforms" as recited in claim 1 and described in the specification (Page 10, line 18 – page 11, line 25). The sequence number in the digital control message is not "a waveform characteristic operative to assign a predetermined value relative to other waveforms in the at least one set," as recited in claim 1. Finally, the analog test call generated by test call generator 103 does not comprise "at least one set of waveforms" as recited in claim 1. Thus, the Examiner has failed to show where either Newman or Kenney, whether taken alone or in combination, teach or suggest the step of comparing, as recited in claim 1, 33, and 35.

The dependent claims are allowable in their own right. For example, the Examiner admits that neither Newman nor Kenney teach or suggest the subject matter of claim 2. The Examiner makes the conclusory statement that since multilevel signaling is known, the claim limitation is obvious. The Examiner's assertion is erroneous for two reasons. First, neither Newman nor Kinney teach the claimed subject matter. Those of ordinary skill in the art will recognize that the use of multi-level signaling is quite different than peak power. Every signal level in a multi-level signal carries data. On the other hand, the present invention merely looks at the peak power level in the signal and discards other power levels in the waveform. Thus, multi-level signaling is not used within an individual waveform. Thus, claim 2 is not directed to multi-level signaling.

Applicant notes that claim 2 includes all of the limitations of claim 1, in addition to the subject matter of claim 2: "the step of transmitting a set of waveforms, wherein each transmitted waveform includes a peak power waveform characteristic operative to assign a predetermined value relative to other waveforms in the at least one set, such that a predetermined sequence of values are assigned to packets carrying the N transmitted waveforms." Neither Newman nor Kinney teach the transmission of a set of waveforms that include "peak power" as the means to assign values. The Examiner's analysis with respect to

the other dependent claims is faulty for the same reasons. Claim 3, for example, recites average power level as being the means to assign a value to each waveform.

Accordingly, the Applicants respectfully assert that claims 1 – 21 and 33 – 38 are patentable under 35 U.S.C. § 103(a) because the Examiner has failed to show how the cited prior art teach or suggest all the claim limitations recited in claims 1, 33, 34, or 35. In fact, the Examiner has failed to point to where the cited art teaches any of the claimed method steps.

Claim 22:

Applicant notes the Examiner has failed to provide an independent analysis for claim 22. The Examiner has failed to point out the element in either Newman or Kenney that corresponds to the claimed transmission unit or the claimed receiver unit. The Examiner failed to point out where either Newman or Kenney teach or suggest, whether taken alone or in combination, a transmission unit that is configured to send at least one set of N waveforms over the telecommunications network, as recited in claim 22.

Similarly, neither Newman nor Kenney teach or suggest, whether taken alone or in combination, a receiver unit that is operative to receive a telephonic signal from the telecommunications network (that includes a packet network), as recited in claim 22.

The dependent claims are also allowable in their own right. For example, neither Newman nor Kenney, whether taken alone or in combination, teach or suggest the subject matter of claim 23 (a computer-readable for storing data representing the set of N-waveforms). The Examiner asserts that the claim element reads on the LFSR shift register disclosed by Kenney in col. 4, line 26 – 37. However, the LFSR is used as a white noise replacement data generator (See col. 5, lines 53 – 56).

Accordingly, the Applicants respectfully assert that claims 22 – 32 are patentable under 35 U.S.C. § 103(a) because the Examiner has failed to show how the cited prior art teach or suggest all the claim limitations recited in claim 22 or in the dependent claims. In fact, the Examiner has failed to point to where the cited art teaches any of the claimed system elements.

2. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

According to MPEP 2143.01, “if the proposed combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are sufficient to render the claims prima facie obvious.” In this case, Newman is directed to a method and apparatus for testing network resources, such as manual operator consoles, in a circuit switched network. This done by a test call generator that transmits analog voice messages to the console via the circuit switched network. Kenney discloses a method for replacing lost packets in a packet network. In order to use Kenney’s inventive concepts in Newman, Newman would have to change his principle of operation, i.e., transmitting packetized test messages to the MOC via a packet network, instead of transmitting voice messages via a circuit switched network.

Accordingly, the Applicants respectfully assert that claims 1 – 38 are patentable under 35 U.S.C. § 103(a) because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings.

B. The Examiner has rejected claims 10, 20, 29, 30, and 37 under 35 U.S.C. § 103 as being unpatentable for obviousness over Newman in view of Kenney as applied to claims 1, 14, 24, and 35, and further in view of Newton’s Telecom Dictionary (hereinafter Newton).

1. The prior art references do not teach or suggest all the claim limitations.

The Applicant has pointed out that neither Newman nor Kenney whether taken alone or in combination, teach or suggest the subject matter of independent claims 1, 22, or 35. Thus, claims 10, 20, 29, 30, and 37 are allowable by virtue of their dependency from the patentable independent claims. Further, these claims are also allowable in their own right. The Examiner points to Newton’s telecom dictionary because it discloses CELP waveforms. Again, the applicant points out that the Examiner is failing to consider all of the claim limitation. The claims are not directed to CELP waveforms. The claims are directed to “transmitting a set of waveforms, wherein each transmitted waveform includes a waveform characteristic, corresponding to a CELP symbol, operative to assign a predetermined value relative to other waveforms in the at least one set, such that a predetermined sequence of values are assigned to packets carrying the N transmitted waveforms.

2. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

See the analysis provided above. The Applicants respectfully assert that claims 1 – 38 are patentable under 35 U.S.C. § 103(a) because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings.

C. The Examiner has rejected claims 13, 21, 31, 32, and 38 under 35 U.S.C. § 103 as being unpatentable for obviousness over Newman in view of Kenney as applied to claims 1, 14, 24, and 35, and further in view of U.S. Patent No. 5,748,876 to Hardy.

1. The prior art references do not teach or suggest all the claim limitations.

The Applicant has pointed out that neither Newman nor Kenney whether taken alone or in combination, teach or suggest the subject matter of independent claims 1, 22, or 35. Thus, claims 13, 21, 31, 32, and 38 are allowable by virtue of their dependency from the corresponding patentable independent claims. Again, the applicant points out that the Examiner is failing to consider all of the claim limitation. The claims are not directed to semantic waveforms per se. The claim limitation in question is directed to “transmitting a set of waveforms, wherein each transmitted waveform includes a waveform characteristic that includes a semantically encoded waveform, operative to assign a predetermined value relative to other waveforms in the at least one set, such that a predetermined sequence of values are assigned to packets carrying the N transmitted waveforms.

2. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

See the analysis provided above. The Applicants respectfully assert that claims 1 – 38 are patentable under 35 U.S.C. § 103(a) because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings for the reasons provide above. Newton and Hardy apply to circuit switched networks whereas Kenney applies to packet switched networks.

4. Conclusion

Based upon the above amendments, remarks, and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests reconsideration of the pending claims 1 - 38 and a prompt Notice of Allowance thereon.

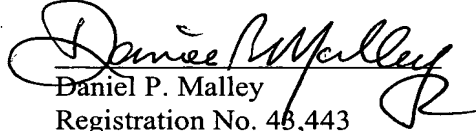
Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Response timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to MCI WorldCom Deposit Account 13-2491.

Please direct any questions or comments to Daniel P. Malley at (607) 256-7307.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the Specification**

Please amend the paragraph at page 2, line 18 – page 3, line 10, as follows:

IntServ and Diffserv protocols have been proposed for improving the reliability and consistency of packet transport for packets carrying voice. RTCP (Real Time Transmission Control Protocol) is being deployed to enable real-time measurements of the receipt of packet data, and for reporting the measurements to a sender or to a network quality monitoring location. However, in a hybrid network that includes both a circuit switched network, such as the PSTN and a packet switched network, the detection of dropped packets is problematic, because none of the protocol data is relayed to the end station. The problem, then, is how to measure dropped frame rates codec-to-codec across a packet switched network when there is no access to packet transmission control data. This problem is exacerbated by the fact that dropped frame rates may be manifested in two distinct ways. First, the dropped packet may simply be skipped. If so, the result is a null (a segment of time with no signal energy at all) in the received voice signal. Alternatively, when a packet has not been received in time to maintain a continuous flow of voice, the receiving codec may simply insert the previous packet or a segment of white noise to avoid a null. This packet loss concealment routine results in repetition of speech waveforms or other phenomena that distort speech signals. It also has the effect of disguising the fact that a dropped packet that would have otherwise been revealed by a null was lost. Thus, the presence of nulls will indicate dropped packets[[.]], when no packet concealment routine is applied, or the number of dropped packets exceeds the dynamic range of the operant packet loss concealment routine. However, the dropped packets whose occurrence is disguised by a packet loss concealment routine will be more difficult to detect mechanically.

Please amend the first paragraph on page 8, as follows:

As embodied herein and depicted in Figure 2, a detailed diagram of test system 10 is disclosed. System 10 is coupled to network 1 by way of telephone-line interface 42. Telephone-line interface 42 is bi-directionally coupled to codec 40. On the transmit side, a stored waveform is retrieved from memory (either RAM 102 or ROM 104) and provided to codec 40 via system bus 110. Codec 40 encodes the digitized sequence of N waveforms retrieved from memory into an analog signal suitable for insertion to the PSTN via a standard

access loop. The encoded analog signal is provided to interface circuit 42 via the bi-directional connection, and transmitted over network 1. Each transmitted waveform is of a duration that matches the payload of a packet generated in a packet switched network 16 (See Figure 1). Thus, each transmitted waveform operates to assign a value to a packet carrying the transmitted waveform. Test system 10 also may function as a standard POTS telephone set. In this mode, A/D converter 32 receives voice generated analog signals from telephone headset microphone circuit 34, and D/A converter 22 transmits analog signals to speaker circuit 24.

Please amend the paragraph at page 10, line 18 – page 11, line 25, as follows:

Figure 3 is a chart showing a method for determining dropped packets in accordance with another embodiment of the present invention. In step 400, a telephonic connection is established between test system 10 and test system 10'. After retrieving the set of N waveforms from memory in step 402, test system 10 is configured to transmit the set of N waveforms over the telecommunications network in step 404 (N is an integer number). Each waveform possesses a different characteristic operant to distinguish it from the other waveforms in the set of N. The characteristic may be average signal power, peak power, frequency, a number of phase changes per waveform segment, a CELP waveform symbol, a bit-pattern reflected in a semantically encoded waveform, or any other suitable means of encoding a distinctive characteristic in a waveform. The set of N waveforms transmitted by system 10 thereby represents a predetermined sequence of values (1,... , N) that index the expected order of the distinguishing characteristics of the N waveforms received and recorded by test system 10'. In one embodiment, each waveform in the set of N includes two waveform segments. The first segment is a sinusoidal wave transmitted at a minimum peak-power level close to a noise floor. The second segment is a sinusoidal wave transmitted at one of N equally spaced power levels between the minimum peak-power level and a maximum peak power level. Thus, the peak power of the second segment functions as the representative waveform characteristic of the transmitted waveform. In the case where $N = 4$, four two-portion waveforms are concatenated and transmitted by system 10 over the telephonic connection. Thus, the transmitted set of N waveforms represents a predetermined sequence of values (1, 2, 3, 4) corresponding to the relative magnitudes of peak power levels of the second segment of each waveform transmitted in sequence. Starting at step 406, the transmission received at test system 10' is processed to produce a corresponding received

sequence of values that reveals the occurrence of dropped packets. Test system 10' receives the transmission from system 10. In step 408, t[T]he transmission is digitized and stored in memory. During post processing (steps 410 – 426), the received transmission is divided into waveform sections having a duration substantially equal to each of the transmitted waveforms, i.e., the duration of a voice sample in a packet transmitted across packet switched network 16. A value is assigned to each waveform based on the relative magnitude of the maximum value of average peak power measured over small subdivisions of each waveform in steps 410 – 412. This produces an integer sequence of values (step 414) associated with the received set of N waveforms that are then compared (step 416) to the predetermined sequence of values encoded by the transmitted set of N waveforms. Deviations (steps 418 – 424) from the predetermined sequence of values then reveal dropped packets. If a value in the sequence is zero, the receiver recognizes that the packet carrying the expected predetermined value was dropped without concealment. If the section sequence includes a repeated value, e.g., 1, 2, 2, 4, the receiver recognizes that the packet carrying value 3 was dropped and concealed. On the other hand, in step 426, no packets were dropped if the sequences match.